The background of the slide is a close-up photograph of tall, thin blades of grass, likely wheat or a similar grain, swaying in the wind. The grass is a vibrant yellow-green color, and the background is a soft, out-of-focus blue sky. The overall mood is natural and agricultural.

Mechatronic Serving Agriculture

Micro.Sp Technology

RADIO-FREQUENCY SINCE 1965

- Established earlier in the 1965, 1.7m € turnover / 14 employees.
- Devoted to RF engineering in the domain of Short Range Device (SRD).
- Has remarkable know-how in Ultra Low power Autonomous Wireless Sensors.
- Innovators in RF with micro.sp[®] breakthrough technology.
- STE is a technology developer, manufacturer.
- Owner of a number of IPs in the domain of data telemetry and automotive area.
- STE grants license to larger companies for mass production.

micro.sp



A CONTRIBUTION TO GLOBAL **GREENHOUSE** EFFECT REDUCTION
IN AUTOMOTIVE, HOME APPLIANCES AND SMART CITIES.

**SENSING
A WORLD
OF THINGS**

A NEW STANDARD IN ENERGY EFFICIENT WIRELESS SENSOR FOR MOBILE APP INTEGRATION THAT MATTER IN THE INTERNET OF EVERYTHING.

- 5 patent applications granted.
- 2 IP pending and waiting for grant.
- High performances in terms of IP contribution to EU market.
- 1 IP application every 2 employees.
- (Q)Be[®] and micro.sp[®] are STE trademarks.
- IP portfolio is currently submitted to estimation.

Intellectual property rights intensive industries:
contribution to economic performance and employment
in the European Union

Industry-Level Analysis Report, September 2013



European Patent Register

ROUTE DEVELOPMENT PLANNING:

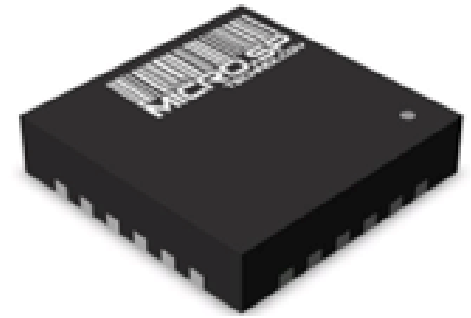
- On going discussion with private equity and venture capitals.
- Integration in co-development with a major market leader in the semiconductors.
- Micro.sp 2.0 SOP 2014 currently in production.
- Micro.sp 3.0 integrated ceramic substrate SOP end 2015.
- Micro.sp 4.0 integrated 7x7 chip core SOP 2016.



micro.sp[™][®] 2.0 is a disruptive for the World of «Internet of Things».

WHAT IS THE MICRO.SP TECHNOLOGY?

- A breakthrough that enables the «trillion vision sensors» in the «IOT».
- It allows applications that are off-limits to competitors.
- Converts any “thing” into a wireless application for the emerging market of «IOT».
- Unveils new and innovative market opportunities.
- Big Data collection in smart cities, Agriculture, industry, automotive.
- Built-in MAC address for true model of business in the IOT world.
- Supports mobile IOT SMARTPHONES BASED applications.
- It is a fusion of Hardware and Software know-how.



**Aiming to redesign the
clouds of wireless sensors
through the most
innovative approach to
energy efficiency.**

Big data at finger tips – Big data collection in a variety of industries such as Smart Cities, Precision Agri, animal feeding, smart city, smart home etc





IOT Driven Next Generation Chip that enables
Big Data

PROS

- ULTRA LOW ENERGY CONSUMPTION.
- RECORD IN MECHANICAL FORM FACTOR.
- LOW COST.
- SMALL BATTERY (LIFETIME 10 YEARS).
- EASY AND FAST TO INTEGRATE.
- INNOVATIVE & UNIQUE WIRELESS PROTOCOL.
- HIGH FLEXIBILITY ENABLING REMOTE MONITORING OF ANY TYPE OF SENSORS.
- 10 YEARS AUTHONOMY USING A QUARTER SIZE LITHIUM BATTERY.
- OPTIONAL BI_DIRECTIONAL.

CONS

- PROPRIETARY PROTOCOL.
- MONODIRECTIONAL COMMUNICATION.





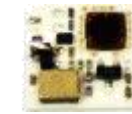
Competitors

Specification	STE PPM	Others	Freescale FXTH8715116T1
Max RF output power	+14dBm	+8dBm	+8dBm
RF consumption in TX mode	PPM: 0,9mA @+14dBm	FSK: 9mA @+8dBm	FSK: 7,6mA @5dBm
Ultra Low standby current	500nA	500nA	500nA
Energy consumption per bit	235,7nJ per bit @ 10kbps	≈2000nJ per bit @10kbps	≈2000nJ per bit @10kbps
Life of system	a) ≈ 10 years with 1 minute data rate transmission using a 1225 lithium battery (48mAh). b) ≈ 20 years with 10 sec data rate transmission using a 2032 (225mAh) lithium battery (exceeding self-discharge of lithium batter). → Suitable for energy harvesting application.	≈ 10years with CR2032 battery (225mAh) * ** *with Axis sensor for wake up and sleep strategy. ** with a transmission rate of 1 minute.	≈ 10years with CR2032 battery (225mAh) * ** *with Axis sensor for wake up and sleep strategy. ** with a transmission rate of 1 minute.

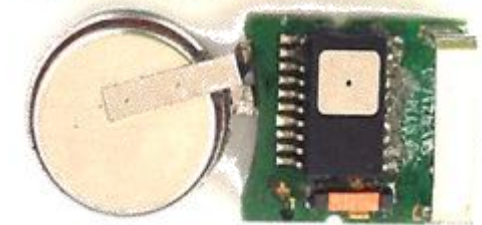
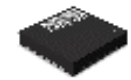
Micro.sp Gen1



Micro.sp Gen2



Micro.sp Gen3

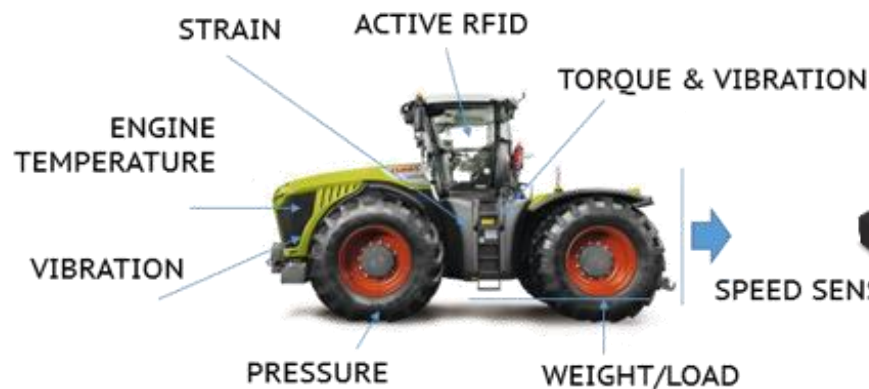


Micro.sp TX consumption 0,9mA @ 14dBm
Competitors TX consumption 7,6mA @ 5dBm

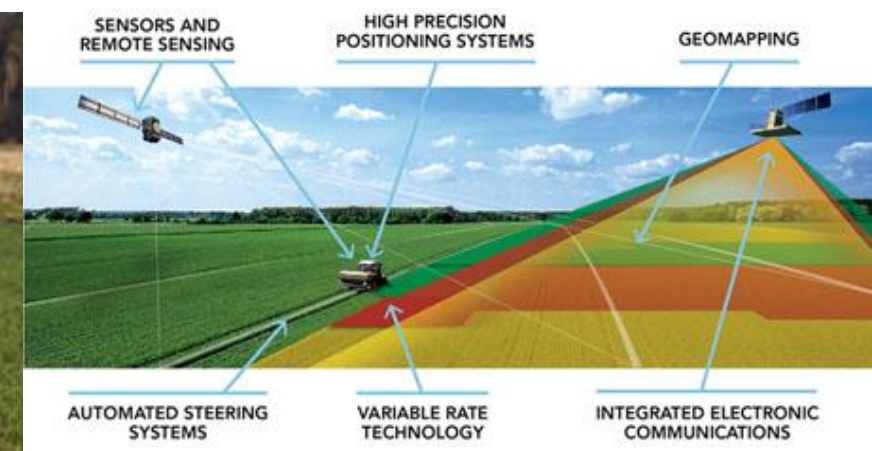


Smart Farm/Smart Agriculture:

- Agriculture Precision wireless sensor for Big Data collection and precise monitoring.
- Wireless sensors such as humidity, temperature, and light can ensure prevention of possible plant diseases or manage watering or frost risks.
- Energy Efficient Wireless Sensors in vehicles for predictive maintenance and reduced labor costs.



16 May
2015



A. Use of auto steering and variable rate controls for inputs.

1. Allows farmers to customize inputs to each section of a field.
2. Based on soil type and historical yield.
3. Minimizing costs and increasing profitability by section



B. Advanced sensors and Big Data.

1. Weather and soil with real time plant health data.
2. Aerial imagery (satellites and the emergence of drones).
3. On-the-ground sensors for in-depth analysis.



C. Real time predictive decision-making to drive:

- lower costs and improved yields.



D. Return on investment realization (ROI improvement).

1. Increased functionality of precision agriculture devices.
2. Integrated software, analytics, and cloud services

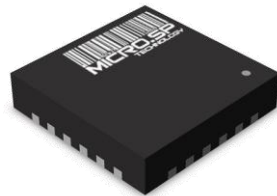


1 AgWired. (2013). Projected Growth in Precision Ag Market. Available: <http://agwired.com/2013/09/13/projected-growth-in-precision-ag-market/>. (accessed 5th Nov 2013)

Micro.sp easy and fast integration of energy efficient wireless sensors to collect and send data to dashboard and mobile applications:

- Micro.sp is flexible architecture to interface STANDARD SENSORS.
- Lower cost of labor and harnesses.
- Improved reliability due to reduction of connectors and cable.
- Reduce costs for system design.

Temperature
Pressure
Strain
Humidity
Light
Inclinometer
Accelerometer
Deformation
Vibration
TPMS



Wireless Vehicle's Infrastructure
Fast integration



MICRO.SP RECEIVER DASHBOARD INTEGRATION
Wireless micro.sp sensors can be managed through gateway, ECU built-in receiver, mobile phones and tablet and deliver data from any part of the vehicles.

SENSOR BOX ISOBUS

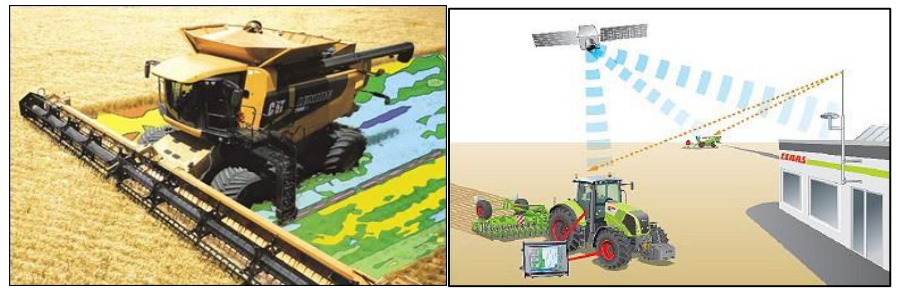


WIRELESS SENSOR BOX

ULTRA LOW POWER
WIRELESS
INFRASTRUCTURE

ISOBUS Wireless Receiver



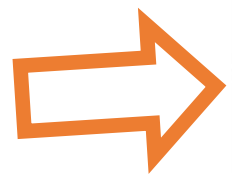


ISO11783 ISOBUS IECU
ISO11783 ISOBUS VT – VIRTUAL TERMINAL

Energy Efficient Wireless Sensors assist:
Variable Rate Technology (VRT)
Real Time Kinematic (RTK)
Precision Agriculture (PA)



WIRELESS AND WIRED SENSORS
DATA TRANSMISSION TO BUILT
IN ECU



ENGINE TRACTION
CONTROL MANAGEMENT

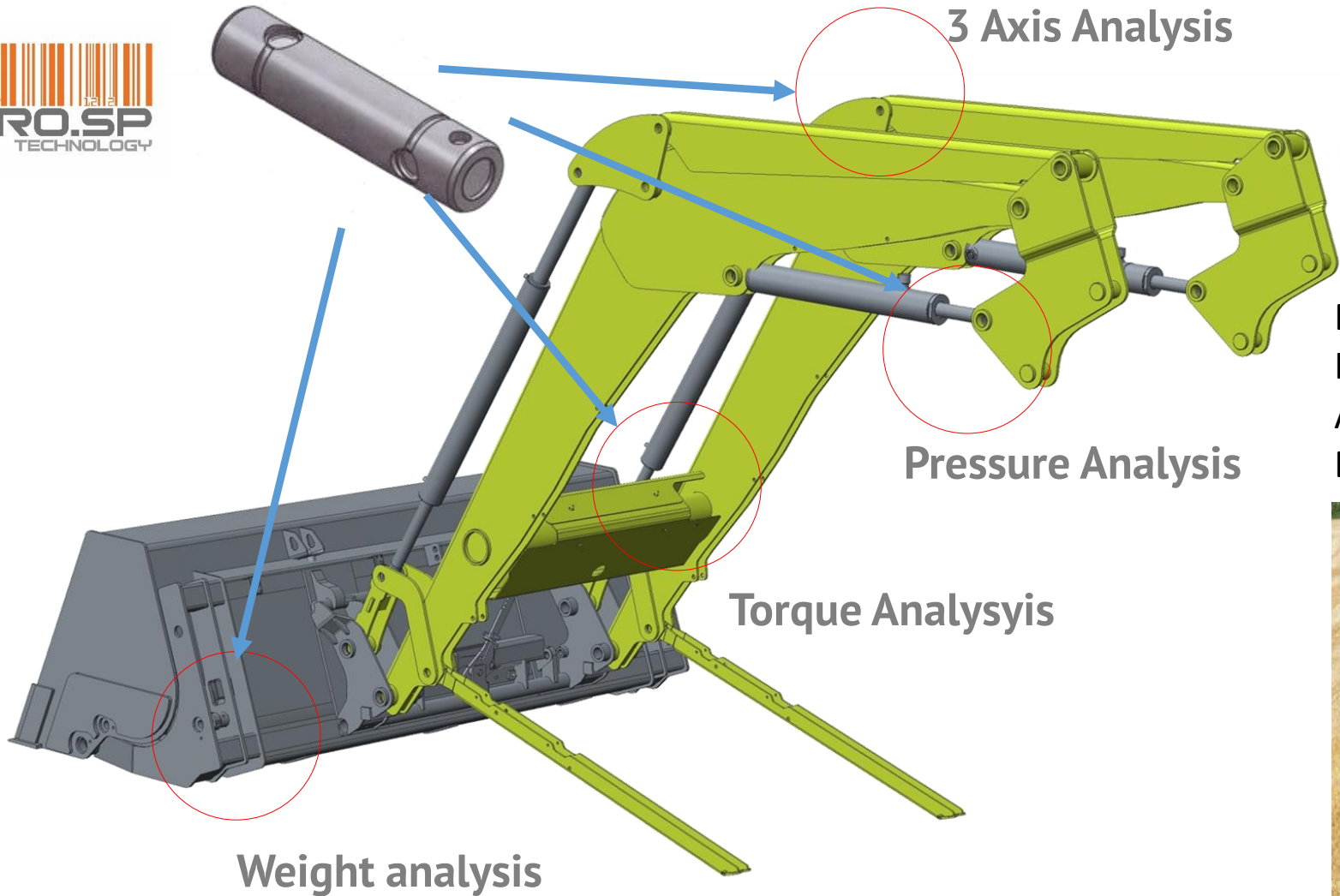


Mechatronic Serving Agriculture

Wireless Sensors



Mechatronics concept in the front loader

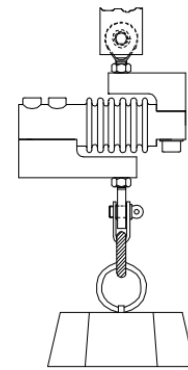
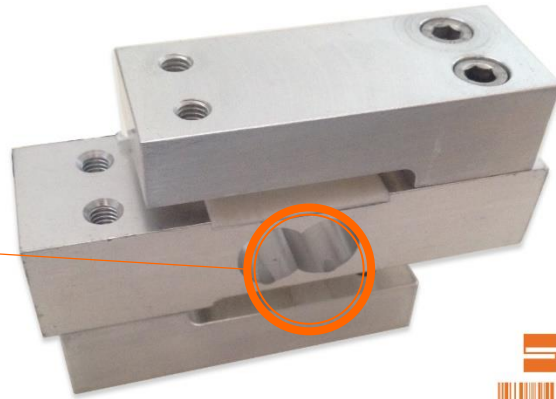


Front loader Arm
Isometric rear view
Assembled with Hydraulic High
Dipping Bucket

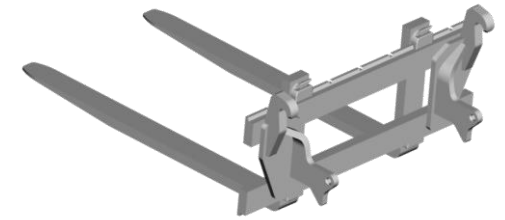


Wireless Load cell

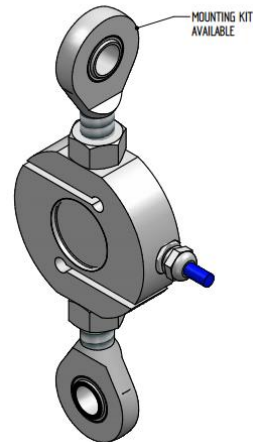
- > Life Time 10 years with a small lithium battery
- > Continuous monitoring
- > Send all the data to the receiver/dashboard



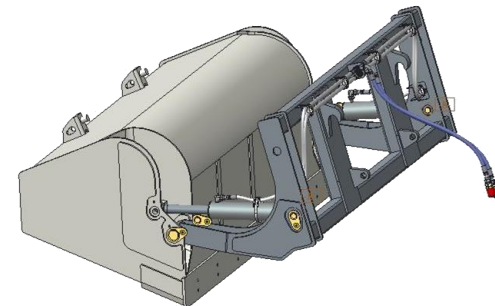
Fork Carrier assy



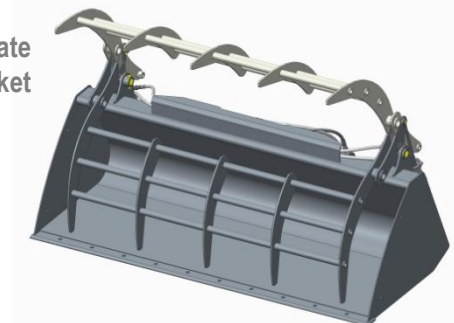
ISOBUS



Hydraulic High Dipping Bucket



Hydraulic Insilate Bucket



Wireless Gasoline Level Measurement

WIRELESS GASOLINE LEVEL MEASUREMENT

- MICRO.SP inside.
- System life-time: over 10Y with lithium cell
- Cost effective solutions.
- Real time monitoring and alarm.
- Reed sensor
- Atex
- Integrated high performance antenna.
- Easy system's level integration.

Additional Features:

- EASY TO INTEGRATE.
- WIRELESS GAUGES.
- WITHOUT CABLE.
- REED SENSOR

Wireless Anti-theft sensor
Fuel Cap sensor integrated



SEND THE DATA TO
THE ALCAR SENSOR BOX



**DASHBOARD
WITH ONLY ONE INTEGRATED
RECEIVER INTEGRATED
READY TO USE**

Connected Energy Wireless sensor in AG Vehicles



- SPEED SENSOR
- ACTIVE RFID
- ENGINE TEMPERATURE
- TORQUE SENSOR



- GASOLINE & OIL LEVEL



- FRONT LOADER
- WEIGHT/LOAD



- ACTIVE RFID



- TORQUE & VIBRATION



- TIRE PRESSURE

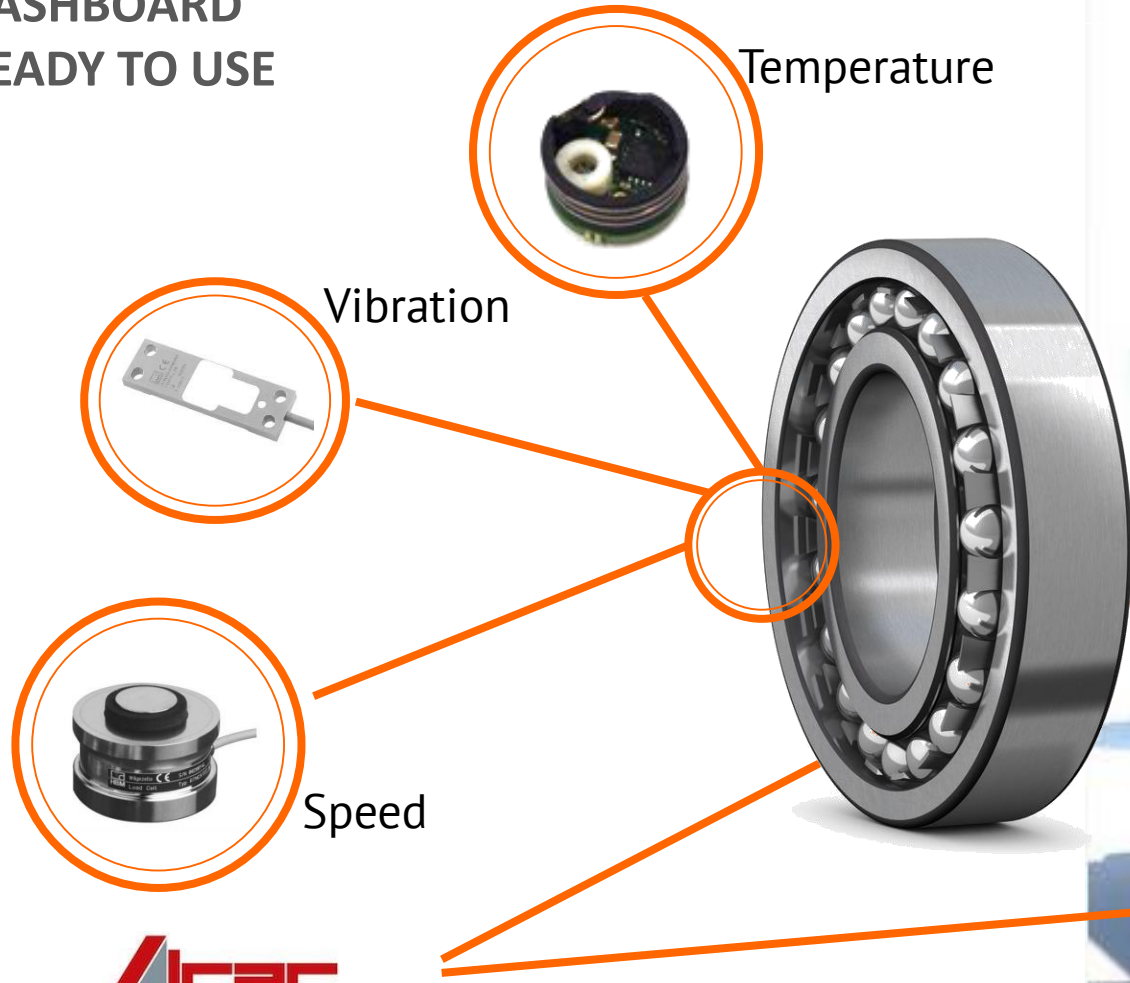


- STRAIN



ISOBUS Wireless sensor box-built in micro.sp receiver.

- DASHBOARD
- READY TO USE





A new tire revolution

Energy efficiency and integration in autonomous wireless sensors matters greatly. STE is leading the pace of innovation: a technology that serves future trends in sensing a world of things is now available. And this “new tire revolution” means bringing intelligent innovation to a world where energy efficiency makes the difference: micro.sp™ is the innovation that makes the tire technology intelligent.



ISOBUS



TPMS

When moving from standard packaging attached to tyre stems to a mechanical complex inside the tyre carcass, the form factor becomes a key feature: STE, recently designated as R&D partner of one of the world's largest tyre maker, is committed to develop an innovative method of data transmission applied to tyres. According to recent experiments conducted by STE on radiowave propagation in carcass, a new PPM modulation scheme has demonstrated an extremely higher energy efficiency along with a greater RF robustness.





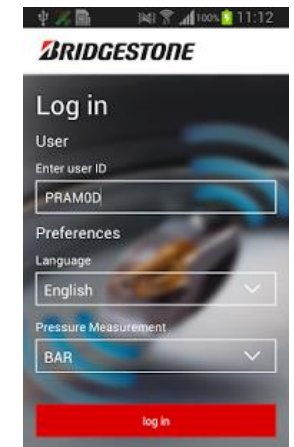
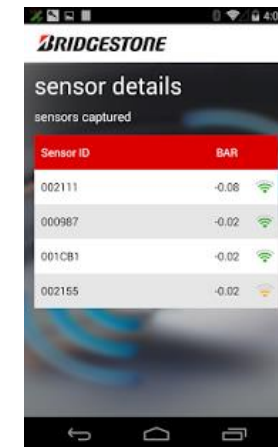
Show presence – CV Show, IAA, Reifen Essen, Bridgestone Days.

IAA 2014: Bridgestone will present its innovative TPMS at the 65th IAA Commercial Vehicles International Motor Show in Hanover (Germany), 25th September to 2nd October 2014



Bridgestone to break ground at Reifen Essen

Bridgestone's dedication to innovation goes well beyond the tyre itself. Which is why Bridgestone's exclusive systems package will also be on display, including the revolutionary Tyre Pressure Monitoring System (TPMS).



Bridgestone's Smartphone App

